

LESSON TITLE: PERFORM OPERATOR PREVENTIVE MAINTENANCE CHECKS AND SERVICES (PMCS) ON TRAILERS

TASK NUMBER: 551-721-1353 (Perform Preventive Maintenance Checks and Services [PMCS] on Trailers)

A. TRAINING OBJECTIVE.

TASK: Perform operator PMCS on a trailer.

CONDITIONS: Given instruction, DA Form 2404 (or ULLS generated DA Form 5988-E), pencils, appropriate trailer operator's manual, equipment records folder, rags, lubricants, and a trailer coupled to an M939 series cargo truck with BII.

STANDARD: Inspect the trailer according to the PMCS tables listed in the appropriate trailer operator's manual, correct all faults within the operator's level of maintenance, and legibly record all others on DA Form 2404 (or ULLS generated DA Form 5988-E). If no faults are found, make necessary entries on DA Form 2404 (or ULLS generated DA Form 5988-E).

B. INTERMEDIATE TRAINING. None.

C. ADMINISTRATIVE INSTRUCTIONS.

1. When training will be given: As scheduled.
2. Training location: Motor pool as scheduled.
3. Training type: Demonstration and practical exercise.
4. Who will be trained: Personnel as scheduled.
5. Principal and assistant instructors required: One primary instructor for the class and one assistant instructor for every two students for the demonstration and practical exercise.
6. Training aids and equipment: Rags, lubricants, DA Form 2404 (or ULLS generated DA Form 5988-E), pencil, appropriate trailer operator's manual, equipment records folder, and a trailer coupled to an M939 series cargo truck with BII for each two students.
7. References: AR 385-55, DA Pamphlet 738-750, and appropriate trailer operator's manual.

D. SEQUENCE OF ACTIVITY.

1. Introduction:
 - a. Interest device.
 - b. Tie-in.
 - c. Lesson objective (paragraph A).
 - d. Procedures:
 - (1) Explanation.
 - (2) Practical exercise.
 - (3) Summary.
2. Explanation and demonstration: Demonstrate before, during, and after checks to students.
3. Practical exercise:
 - a. Assign students to coupled trailers and issue trailer operator's manuals, pencils, DA Form 2404 (or ULLS generated DA Form 5988-E), and equipment records folder. Tell students where rags and lubricants are located.
 - b. Students perform PMCS.
4. Evaluate: Check each student's PMCS performance.
5. Summary:
 - a. Recap main points.
 - b. Allow for questions.
 - c. Clarify questions.
 - d. Give closing statement.
6. Retraining: Retrain NO-GOs and slow learners.

E. SAFETY RESTRICTIONS.

1. Ensure that all chock blocks are in place when vehicles are parked or maintenance is to be performed.
2. If trailer is not coupled to towing vehicle, ensure the trailer wheels are securely chocked. Failure to do so may cause the trailer to roll, resulting in injury to personnel or damage to equipment.
3. Ensure the transmission is in N, the parking brake is set, and the engine is shut off before leaving the vehicle, when the vehicle is parked, or maintenance is being performed.
4. Ensure all personnel remove all wristwatches, rings, bracelets, ID tags, neck chains, and any other jewelry before working in or around the vehicle or trailer.
5. Ensure all personnel pay particular attention to the cautions and warnings listed in the operator's manuals.
6. Ensure personnel maintain at least three points of contact when mounting or dismounting the trailer (to include performing PMCS).
7. Ensure all personnel stand clear of towing vehicle and trailer during coupling and uncoupling operations. Failure to follow this warning may result in serious injury or death.

F. ENVIRONMENTAL CONSIDERATIONS.

1. Ensure that all hazardous materials and hazardous wastes are stored and labeled properly.
2. Ensure that spill kits are within reach when changing or adding vehicle fluids or in the case of vehicle failures. Spill kits should enable the soldiers to contain a spill on land or in water.
3. Ensure that drip pans remain under parked vehicles.
4. Ensure that containers are the proper size and type for draining vehicle fluids.

G. ADDITIONAL COMMENTS AND INFORMATION. Recommended instructional time is 1.0 hours (.5 demonstration and .5 practical exercise). The remaining PMCS is performed in conjunction with driving tasks.

LESSON TITLE: DRIVE AN M939 SERIES CARGO TRUCK WITH TRAILER

TASK NUMBER: 551-721-1380 (Transport General Cargo in Trailer) and 551-721-1385 (Couple/Uncouple Pintle-Connected Trailer)

A. TRAINING OBJECTIVE.

TASK: Drive an M939 series cargo truck with trailer.

CONDITIONS: Given instruction, DD Form 1970 (or ULLS generated DA Form 5987-E), DA Form 2404 (or ULLS generated DA Form 5988-E), pencil, TM 9-2320-272-10, appropriate trailer operator's manual, equipment records folder, rags, lubricants, coolant, designated driving route (improved surfaced and secondary roads), an M939 series cargo truck with BII, trailer and vehicle loads, suitable training area, and a requirement to drive a designated route.

STANDARD: Without accident or injury, drive the designated route. Couple and uncouple the trailer, back the trailer in a straight line, and perform basic driving maneuvers.

B. INTERMEDIATE TRAINING. None.

C. ADMINISTRATIVE INSTRUCTIONS.

1. When training will be given: As scheduled.
2. Training location: Motor pool, training area, and driver training route as scheduled.
3. Training type: Conference, demonstration, and practical exercise.
4. Who will be trained: Personnel as scheduled.
5. Principal and assistant instructors required: One primary instructor for the conference and one assistant instructor for every two students for the demonstration and practical exercise.
6. Training aids and equipment: Rags, lubricants, coolant, 40 traffic cones or empty POL drums, suitable driver training area, and designated driving route (improved surfaced and secondary roads). DD Form 1970 (or ULLS generated DA Form 5987-E), DA Form 2404 (or ULLS generated DA Form 5988-E), pencil, TM 9-2320-272-10, appropriate trailer operator's manual, equipment records folder, and a trailer coupled to an M939 series cargo truck with BII for each two students.
7. References: AR 385-55, DA Pamphlet 738-750, FM 21-305, TM 9-2320-272-10, and appropriate trailer operator's manual.

D. SEQUENCE OF ACTIVITY.

1. Introduction:
 - a. Interest device.
 - b. Tie-in.
 - c. Lesson objective (paragraph A).
 - d. Procedures:
 - (1) Explanation.
 - (2) Practical exercise.
 - (3) Summary.

2. Explanation and demonstration:

NOTE: The instructions contained in this lesson for a pintle-connected trailer are in general terms because this lesson covers a variety of trailers. Although procedures for these types of trailers are similar, the instructor should consult the specific trailer operator's manual for detailed instructions. Also, when towing other authorized equipment such as towed howitzers, consult the specific TM for the equipment being towed before conducting any towing operations.

- a. Connect the trailer to the vehicle.

WARNING

All personnel must stand clear of towing vehicle and trailer during coupling operation. Failure to comply with this warning may result in serious injury or death to personnel.

- (1) Sound the horn before backing. Using ground guides, back the vehicle to the trailer. Be sure no one stands between the vehicle and trailer.

WARNING

Do not back up without a ground guide. Failure to do this may result in damage to vehicle, injury, or death.

CAUTION

Do not back up with transfer case shift lever in low range.

WARNING

When backing or going forward, ground guides should never stand directly in the vehicle's path. Keep 10 yards between the vehicle and ground guides at the front or rear and at the corners of the vehicle (never directly behind the vehicle). Ground guides must not position themselves between the vehicle being guided and another object where an inadvertent engine surge or momentary loss of vehicle control could cause injury. The vehicle driver will immediately stop the vehicle if he loses sight of ground guides or notes that the guide is dangerously positioned between the vehicle and another object. In such cases, the vehicle driver will secure his vehicle, dismount, and make an on-the-spot correction before commencing operations.

- (2) Stop the vehicle. Engage the parking brake. Shut off the engine. Get out of the vehicle to connect the trailer.
- (3) Remove the pintle safety cotter pin and open the pintle. Release the trailer handbrake(s).
- (4) Lift the trailer. (Some trailers are light and can be lifted by one person, while others will require several people, and still others have a mechanical lift.) Secure the trailer drawbar ring in the pintle of the towing vehicle. Close the pintle. Install the pintle safety cotter pin in the pintle.
- (5) Hook the two safety chains from the trailer to the rear lifting shackles of the towing vehicle.
- (6) Raise the retractable support (landing leg).
- (7) Connect the intervehicular brake hoses to the towing vehicle. Turn on the air supply.
- (8) Connect the intervehicular electrical cable to the towing vehicle.
- (9) Operate the controls in the towing vehicle to check brake action and operation of all lights.

b. Disconnect the trailer from the vehicle.

- (1) Position the trailer on level ground if possible.

WARNING

All personnel must stand clear of towing vehicle and trailer during uncoupling operation. Failure to comply with this warning may result in serious injury or death to personnel.

- (2) Close the vehicle's air coupling shut-off cock(s) and disconnect the intervehicular brake hose(s). Stow on the bracket provided on the trailer.
- (3) Lower the retractable support (landing leg). Ensure it is locked in position to prevent the trailer from falling.
- (4) Unhook the safety chains.
- (5) Remove the pintle safety cotter pin and open the pintle.
- (6) With assistance, remove the drawbar ring from the towing vehicle and lower the trailer on its support leg.
- (7) Apply the trailer hand brake or chock wheels to prevent trailer movement.
- (8) Close the pintle. Reinstall the pintle safety cotter pin in the pintle.
- (9) Level the trailer if required and perform after-operation PMCS on the trailer.

c. Driving. When driving the towing vehicle and trailer, keep the overall length of the unit in mind when passing other vehicles and turning. Backing is also affected because the unit is hinged in the middle.

WARNING

Before moving trailer, ensure all loose equipment is properly stowed and that nothing will drag on the ground. If trailer is loaded, ensure that load is properly secured. Failure to follow this warning may result in injury to personnel or damage to equipment.

- (1) Safely towing a trailer requires increased concentration, alertness, and strict compliance with towing speeds.

(2) Trailers have a tendency to fishtail or swerve very easily when the driver makes an erratic movement of any magnitude. This can be caused by—

- (a) Speed.
- (b) A slight swerve to miss a pothole.
- (c) A quick lane change.
- (d) A slip of the hand on the steering wheel.
- (e) Rough or uneven road.

(3) To prevent trailer fishtail or swerve—

- (a) Never exceed the recommended speed for the trailer that you are towing.
- (b) Never exceed the trailer's maximum recommended weight capacity.
- (c) Always slow down for curves, wet or rough roads, or downgrades.
- (d) Anticipate all stops to take longer as a result of the added weight. Brake early and gently. Do not slam on the brakes.
- (e) On downgrades, slow down before starting downhill. Use a lower gear. Let the engine compression help slow the vehicle.

(4) To correct trailer fishtail or swerve—

- (a) Steer straight ahead.
- (b) Gradually decelerate.
- (c) Do not brake until both the towing vehicle and trailer have stabilized.

(5) When turning corners, allow for the fact that the trailer wheels turn inside the turning radius of the towing vehicle.

(a) To make a right turn—

- Check traffic ahead, to the rear, and to the right side.
- If not in the right-hand lane, be sure that lane is clear, signal, and move into the lane well in advance of the turn.

- Signal for the turn at least 150 feet in advance and reduce speed.
- Check other traffic that is in, at, or approaching the intersection. (Be sure no bicycle or motorcycle is to the right. Be especially alert for pedestrians.)
- Take a position farther from the curb or edge of the pavement (still within the right lane) than the driver would if driving a straight truck (no trailer).
- Drive the truck approximately halfway into the intersection and then cut sharply to the right. This will keep the trailer wheels off the curb.
- Keep the vehicle close enough to the edge of the road to prevent following vehicles from trying to pass on the right.
- During the turn, monitor the mirrors for off-tracking and keep both hands on the steering wheel.
- If you cannot make the turn without swinging into another lane, turn wide as you complete the turn.
- If you must cross into an oncoming lane and a vehicle comes toward you, allow it to get by you. Stop if you have to, but do not back up.
- After completing the turn, cancel the signal.
- When it is safe to do so, steer the vehicle into the desired lane (four-lane roads).

(b) To make a left turn–

- Check traffic ahead, to the rear, and to both sides.
- Signal for the turn at least 150 feet in advance and reduce speed.
- Check other traffic that is in, at, or approaching the intersection.
- Ensure there is an adequate gap to make a turn in front of traffic.
- Before turning, drive the truck into the center of the intersection to allow for the trailer.
- Turn hard to the left. Watch for oncoming traffic, if applicable.
- During the turn, monitor the mirrors for off-tracking and keep both hands on the steering wheel.
- If you are turning into a multi-lane street, enter the right lane.
- If there are two left turning lanes, start your turn from the right-most lane.
- After completing the turn, cancel the signal.

(6) Stopping requires more distance when pulling a trailer. Apply brakes gradually and smoothly. Stepping on the brake pedal will stop both the towing vehicle and trailer.

WARNING

Apply brakes gradually when slowing or stopping and pump brakes gradually when slowing or stopping the vehicle on ice, snow, or wet pavement. A panic stop will cause the vehicle wheels to lock and the engine to stall. Power steering will be lost. Failure to apply brakes gradually can result in injury or death.

WARNING

Rapid operation repeatedly of service brakes will consume compressed air supply and cause automatic spring brake application. Failure to follow proper service brake operating procedures may cause serious injury or death to personnel.

d. Backing the trailer in a straight line. Since the driver cannot see directly behind the vehicle, backing is always dangerous. Avoid backing whenever possible, even if you must go around the block to do so. When backing follow these rules.

(1) Get out of the vehicle. Check the area to the sides, rear, and overhead for obstructions.

(2) Use ground guides to direct while backing.

WARNING

When backing or going forward, ground guides should never stand directly in the vehicle's path. Keep 10 yards between the vehicle and ground guides at the front or rear and at the corners of the vehicle (never directly behind the vehicle). Ground guides must not position themselves between the vehicle being guided and another object where an inadvertent engine surge or momentary loss of vehicle control could cause injury. The vehicle driver will immediately stop the vehicle if he loses sight of ground guides or notes that the guide is dangerously positioned between the vehicle and another object. In such cases, the vehicle driver will secure his vehicle, dismount, and make an on-the-spot correction before commencing operations.

CAUTION

Do not back up with transfer case shift lever in low range.

- (3) Adjust the rearview mirrors before backing.
- (4) Sound the horn before backing, where it is legal to do so.
- (5) Remember, when backing, the trailer's rear will move in the opposite direction from which the front towing vehicle wheels are turned.
 - (a) If the wheels are turned to the right, the trailer will go left.
 - (b) If the wheels are turned to the left, the trailer will go right.
- (6) Make gradual steering corrections in relation to trailer alignment.
- (7) Pull up if necessary to improve the trailer's alignment.
- (8) Stop the vehicle when the desired position is reached.
- e. Explain to the students that they must perform before-, during-, and after-operation PMCS on their assigned vehicle.
- f. Demonstrate hand and arm signals required for this exercise.
- g. Demonstrate driving through each maneuver.

3. Practical exercise:

- a. Assign students to vehicles/trailers and issue TM 9-2320-272-10, trailer operator's manuals, pencil, DD Form 1970 (or ULLS generated DA Form 5987-E), DA Form 2404 (or ULLS generated DA Form 5988-E), and equipment records folder. Tell students where rags, lubricants, and coolant are located.
- b. Students perform before-operation PMCS.
- c. Students practice maneuvering the truck through the courses laid out in the training area(s). Sample training areas are in Chapter 6. During-operation PMCS is also conducted at this time.

NOTE: As each student practices driving, an assistant instructor rides in the seat next to the driver. The assistant instructor explains driving techniques, ensures the driver is aware of driving situations, and conducts AARs with each driver. Now is the time to pass on valuable experience and correct any bad driving habits.

- d. After the students have mastered driving the vehicle in the training area, they will practice driving on the road.

- e. Students perform after-operation PMCS. Ensure all operator entries required on DD Form 1970 (or ULLS generated DA Form 5987-E) and DA Form 2404 (or ULLS generated DA Form 5988-E) are accurate, complete, and legible.
- 4. Evaluate: Check each student's performance of PMCS and driving.
- 5. Summary:
 - a. Recap main points.
 - b. Allow for questions.
 - c. Clarify questions.
 - d. Give closing statement.
- 6. Retraining: Retrain NO-GOs and slow learners.

E. SAFETY RESTRICTIONS.

- 1. Ensure that all chock blocks are in place when vehicles are parked or maintenance is to be performed.
- 2. Ensure the transmission is in N, the parking brake is set, and the engine is shut off before leaving the vehicle, when the vehicle is parked, or maintenance is being performed.
- 3. Ensure all personnel remove all wristwatches, rings, bracelets, ID tags, neck chains, and any other jewelry before working in or around the vehicle.
- 4. Ensure all personnel pay particular attention to the cautions and warnings listed in the operator's manuals.
- 5. Ensure the driver and ground guides know and understand the hand and arm signals, especially the signal to stop, as outlined in FM 21-305.
- 6. Ensure ground guide(s) are used when backing.
- 7. Ensure all backing is conducted at a speed of 5 MPH or less.
- 8. Hearing protection is required for all personnel working in and around this vehicle while the engine is running.
- 9. Inspect all seat belts for damage and ensure all occupants wear seat belts while the vehicle is in operation.
- 10. Ensure personnel maintain at least three points of contact when mounting or dismounting the vehicle (to include performing PMCS).

11. Ensure all personnel are clear of vehicle before engine start is attempted. Operator must visually check to see that all areas of the truck are clear of personnel before attempting to start the engine. Failure to do so could result in serious injury or death to personnel.

12. Extreme care should be taken when removing the surge tank filler cap if the temperature gauge reads above 175° F. Steam or hot coolant under pressure will cause injury such as serious burns.

13. The exhaust pipe and muffler can become very hot during vehicle operation. Be careful not to touch these parts with bare hands or allow the body to come in contact with the exhaust pipe or muffler. Exhaust system parts can become hot enough to cause serious burns.

14. Reemphasize the removal of all jewelry such as rings, ID tags, or bracelets before working around batteries. Be careful not to short out battery terminals. If jewelry or tools contact the battery terminal, a direct short may occur resulting in instant heating, damage to equipment, and injury to personnel. Do not smoke or use open flame near batteries. Batteries may explode from a spark. Battery acid is harmful to skin and eyes.

15. Fuel is very flammable and can explode easily. To avoid serious injury or death, keep fuel away from open fire and keep a fire extinguisher within easy reach when working with fuel. Do not work on the fuel system when the engine is hot. Fuel can be ignited by the hot engine. When working with fuel, post signs that read: “NO SMOKING WITHIN 50 FEET OF VEHICLE”.

16. Alcohol used in alcohol evaporator is flammable, poisonous, and explosive. Do not smoke when adding fluid and do not drink fluid. Failure to do this could result in injury or death.

17. Do not use hand throttle while driving. When brakes are applied, the hand throttle does not automatically disengage. Using the hand throttle as a “cruise control” device could result in injury or death.

18. Apply brakes gradually when slowing or stopping and pump brakes gradually when slowing or stopping the vehicle on ice, snow, or wet pavement. A panic stop will cause the vehicle wheels to lock and the engine to stall. Power steering will be lost. Failure to apply brakes gradually can result in injury or death.

19. Rapid operation repeatedly of service brakes will consume compressed air supply and cause automatic spring brake application. Failure to follow proper service brake operating procedures may cause serious injury or death to personnel.

20. Never use the parking brake for normal braking. The wheels will lock up causing a severe skid. A skidding vehicle could result in serious injury or death.

21. Excessive use of the service brake to control downhill speed will result in the loss of braking power because of heat buildup.

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22. Do not put the vehicle in motion until the low air pressure warning light goes out and the alarm (buzzer) stops sounding. Air pressure gauges should indicate at least 90 psi. If warnings continue beyond three minutes, and/or pressure gauges do not reach 90 psi, turn the ignition switch and battery switch to OFF positions, and notify unit maintenance. Failure to do this could result in injury or death.

23. When raising the vehicle hood, ensure it is secured from falling. Do this by securing the hood retaining bar to the bumper bracket with the safety pin. Failure to do so may damage the vehicle or cause injury or death to personnel.

24. All personnel must stand clear of towing vehicle and trailer during coupling and uncoupling operations. Failure to comply with this warning may result in serious injury or death to personnel.

25. Before moving trailer, ensure all loose equipment is properly stowed and that nothing will drag on the ground. If trailer is loaded, ensure that load is properly secured. Failure to follow this warning may result in injury to personnel or damage to equipment.

F. ENVIRONMENTAL CONSIDERATIONS.

1. Ensure that all hazardous materials and hazardous wastes are stored and labeled properly.

2. Ensure that spill kits are within reach when changing or adding vehicle fluids or in the case of vehicle failures. Spill kits should enable soldiers to contain a spill on land or in water.

3. Ensure that drip pans remain under parked vehicles.

4. Ensure that containers are the proper size and type for draining vehicle fluids.

G. ADDITIONAL COMMENTS AND INFORMATION. Recommended instructional time is 15 hours (.5 conference, .5 demonstration, and 14.0 practical exercise, including 2.0 PMCS).